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I, JANENE PEISKER, TEAM LEADER EXAMINATION SUPPORT AND SALES hereby certify that annexed is a true copy of the Provisional specification in connection with Application No. 2004901533 for a patent by PHILLIP VAFIADIS as filed on 24 March 2004.

I further certify that the name of the applicant has been amended to PHILIP VAFIADIS pursuant to the provisions of Section 104 of the Patents Act 1990.

WITNESS my hand this  
Fifth day of April 2005

A handwritten signature in black ink, appearing to read 'J. Peisker'.

JANENE PEISKER  
TEAM LEADER EXAMINATION  
SUPPORT AND SALES



PHILLIP VAFIADIS

AUSTRALIA

PATENTS ACT 1990

PROVISIONAL SPECIFICATION FOR AN INVENTION ENTITLED:-

"AUDIO VISUAL SURFACE ASSEMBLY "

This invention is described in the following statement:-

This invention relates to audio visual presentation arrangements and in particular wall-mounted arrangements.

## BACKGROUND

- 5 The enjoyment of audio and visual entertainment, in particular pre-recorded or broadcast audio and visual entertainment is a very personal experience. It is therefore expected that there is a wide variety of audio and visual arrangements available to deliver that experience.
- 10 A simple arrangement may comprise a compact disc player connected to left and right speakers through an amplifier located on a shelf typically arranged facing the listener. A simple video display arrangement may comprise a television connected to a video cassette or digital versatile disk player with audio being reproduced by speakers associated with the television.
- 15 At another end of an arrangement scale is a full cinematic experience which is provided by a two-storey high by tens of metres wide 2.81:1 format screen and banks of high power amplifiers and speakers positioned behind the screen. Projection of the image is done from a distance over the heads of the viewers/listeners.
- 20 Such is the sophistication of the electronics, associated optics and quality of speakers available to relatively wealthy consumers, that a very effective cinematic experience can now be replicated in home theatres and business commercial environments.
- 25 Audio visual arrangements vary for many reasons including cost, space availability, aesthetics, technical excellence, personal wants, and business needs etc. The acoustic qualities of the environment are also important. It is not uncommon for drapes, furniture fabric, carpeting and sometimes passive and active sound reflection and absorption devices to be strategically located within a room to enhance the listening
- 30 experience.

The wall upon which the image is projected or upon which an active screen (plasma or liquid crystal display) is mounted, typically needs to be prepared. Speakers, if they are to be mounted on the wall, the wall may need to have channels chased into them and once the speaker wiring is installed the channels are restored to a presentable finish.

In the case of a projection screen, specialist suppliers can provide a stiff and preferably light framework over which a sheet of suitable reflective high contrast material is fitted. Alternatively, there are roll-up screens, some of which are motorised and remotely controllable.

As will be apparent from the very brief description of current arrangements there are many individual elements that make up an audio visual arrangement and the way that they all come together requires the skill of many highly trained individuals.

It is an aim of the invention described herein to offer a further alternative arrangement, one that minimises or eliminates some of the problems and complexities of creating an audio visual presentation arrangement in a home, office or commercial environment. The arrangement disclosed herein may also be a cheaper, more convenient and rapidly installed system than the alternatives currently available, while still allowing creative aesthetic treatment to suit its surrounds.

#### **BRIEF DESCRIPTION OF THE INVENTION**

In a broad aspect of the invention a sound and/or visual presentation arrangement includes at least two enclosure modules for housing one or more of an audio or visual component adapted for mounting in a planar mounting surface adjacent one another, wherein said module when mounted, has a substantially planar facing surface and a further said module is shaped along one or more sides to abut a said one other module to match each other's planar surfaces and provide a channel between said adjacent sides.

In a further aspect of the invention said module has a major facing surface and four solid wall surfaces that rearwardly converge inwardly from the periphery of said major surface and converge to a common substantially planar solid minor surface to form said enclosure behind said major surface.

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In a yet further aspect of the invention said major surface lies substantially flush with the substantially planar visible surface of said visual component (video monitor screen).

- 10 In another aspect of the invention said enclosure envelops one or more of an audio component being a sound driver (speaker); sound absorber; sound diffuser; active audio equipment (amplifier, cross-over, etc).

- 15 In yet another aspect of the invention said major facing surface is covered with a fabric.

In the previous aspect said fabric is of such a character that it is suitable for projection of visual images and/or is acoustically transmissive.

- 20 In accordance with the previous aspects said fabric can be located over two or more adjacent enclosure modules to form a single planar surface.

In accordance with the previous aspects one or more layers of fabric of the same or different characteristic cover said facing surface.

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In a further aspect of the invention the arrangement further includes said minor surface being adapted for mounting on the planar mounting surface.

- 30 In a yet further aspect of the invention the arrangement is configured such that two opposed solid wall surfaces of the module are orientated at 90° to each other, thus said enclosure module can be mounted to planar surfaces at 90° to each other (room corner).

Throughout this specification unless the context requires otherwise, the words "comprise" and "include" and variations such as "comprising" and "including" will be understood to imply the inclusion of the stated integer or group of integers but not the exclusion of any other integer or group of integers. Further, the use of particular examples of alternatives is not an indication or admission that those examples are part of a common knowledge of those skilled in the art.

Specific embodiments of the invention will now be described in some further detail with reference to and as illustrated in the accompanying figures. These embodiments are illustrative, and not meant to be restrictive of the scope of the invention. Suggestions and descriptions of other embodiments may be included within the scope of the invention, but they may not be illustrated in the accompanying figures or alternatively features of the invention may be shown in the figures but not described in the specification.

#### **BRIEF DESCRIPTION OF THE FIGURES**

Fig 1 depicts a front perspective view of a single module;

Fig 2 depicts a rear view of a single module;

Fig 3 depicts a front view of a single module with diffuser infill;

Fig 4 depicts a cross-sectional view along line A-A of Fig 1 showing an absorber infill;

Fig 5 depicts a cross-sectional view along line B-B of Fig 3 showing a diffuser infill;

Fig 6 depicts a front view of a single module having a diffuser infill;

Fig 7 depicts a front view of a single module having a driver (speaker) infill;

Fig 8a depicts a section view of a single module having a driver infill;

Fig 8b depicts a section view of a single module having a small flat monitor infill

Fig 8c depicts a section view of a single module having an electronic device infill;

Fig 9 depicts a vertical wall surface having an array of modules fitted thereto;

Fig 10 depicts the arrangement of Fig 8 with a single material cover over all of those modules;

Fig 11 depicts the module installed in a corner;

Fig 12 depicts a presentation arrangement including a video display surrounded by an array of modules;

Fig 13 depicts one possible mounting arrangement for the mounting of an array of modules; and

- 5 Fig 14 depicts one embodiment of a mounting arrangement of an array of modules showing a channel space behind the modules.

#### DETAILED DESCRIPTION OF EMBODIMENTS OF THE INVENTION

- 10 A perspective view of an enclosure 10 is depicted in Fig 1. In this embodiment the enclosed volume forming the enclosure 10 has four side walls 12, 14, 16 and 18 and a rear planar wall 20 (refer also to Figs 2 and 3).

- 15 The module could be made from injection moulded plastic to keep costs to a minimum once the moulding costs are amortised, but a variety of other materials could be used to form the enclosure such as for example MDF or wood. The latter materials however require greater labour costs to machine and construct the module.

- 20 The front of the enclosure is open (Fig 1) and the periphery of the enclosure opening is a frame over which a covering 22 (not shown) is fitted (see Fig 4). The surface thus created is the visible part of the then created module 24.

- 25 Preferably, the covering is an aesthetically acceptable material and typically will comprise a cloth of suitable colour. For the sake of consistency, each module will be covered in the same material but that may vary for aesthetic requirements and since the module will also typically have an audio process associated with it (speaker housing, sound absorber or diffuser), the material chosen will have acceptable sound transmission characteristics. That is, it will generally have a very low sound attenuation and distortion characteristic, if any.

- 30 However, compromises may be required and some cloth material may be better for printing upon or for reflection of projected light images. In the case of a printing requirement, images of an advertising or aesthetic nature can be printed on the



material either before fitment or after fitment. Alternatively, or in addition to the above, the cloth may be printed with a single colour that conforms to a known colour standard. Therefore, the cloth colour can be made to better match or complement its environment.

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Details of presentation arrangements incorporating one or more of those aspects will be described later in the specification.

Fig 4 also depicts a cross-sectional view of a module that contains audio frequency  
10 absorbent material 24 so that the module will absorb sound energy that enters via the cloth covered front major surface. The module or an array of such modules can be located along a wall and possibly on or within ceiling surfaces so as to adjust the acoustic properties of a room. The dimensions of the module can be such that one or more of them can be readily accommodated in standard ceiling panel frameworks.

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The absorbent material is typically foam and audio frequency absorbency characteristics are largely determined by the density of the foam. This characteristic can be controlled at the time of manufacture of the foam used in the module as required. Other absorbent material can be used such as glass fibres, etc.

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Fig 5 depicts a cross-sectional view of a module that contains an audio frequency  
diffuser 26 so that the module will diffuse sound energy that enters via the cloth covered front major surface. The module or an array of such modules can be located along walls and possibly ceiling surfaces so as to adjust the acoustic properties of the  
25 room.

25

The diffuser is typically formed by an array of rectangular cavities as depicted in Fig 6, the length and volume of which are designed to redistribute the impinging sound in a manner other than that which would be created by a flat surface. The wall of the  
30 cavities is a solid material so that reflectance of a predetermined type will occur in a controlled manner. Although it is likely that the array of cavities will be the same for most modules, it is possible for the array of cavities to differ as diffusion

characteristics may also need to differ. It is preferable that the array of cavities is itself an injection moulded plastics element adapted for easy fitment and if necessary engagement with the interior of the module.

- 5 Fig 7 depicts a module frame having an audio driver (speaker) 28 located centrally of the enclosure. Alternative audio driver configurations including multiple drivers in the same cabinet are possible. Various loading techniques could be applied to the drivers to achieve desired results eg. reflex ports. Not shown but likely to also be used is a sound absorbent material surrounding the speaker. However, the desired
- 10 audio characteristics of the speaker and enclosure as a whole will determine whether audio absorbent material or sound reinforcing cavities are used to create the desired audio characteristics.

A board can be fixed to the front of the frame to which the driver is attached.

15

Fig 8a depicts a cross-sectional view of a module housing a speaker 28.

- Fig 8b depicts a cross-sectional view of a module having a visual presentation device in the form of a flat panel display 30. Plasma and liquid crystal display flat panels
- 20 are suitable but other types may be accommodated if desired and adequate space is available.

Fig 8c depicts a cross-sectional view of a module having an electronic device 32 located inside the module.

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- Fig 9 depicts a vertical surface having an array of modules fitted thereto. As will be apparent one or more of the modules can be of the type described above. By way of example, a sound wall can be created by installing a driver in two opposed modules a and c as well as matching drivers in modules d and f while modules b and e can be
- 30 fitted with sound absorbent material. The wiring shown (dotted lines to each module) is merely indicative of the route such wiring could take.

Fig 10 depicts an array of modules (dotted lines) covered with a single piece of cloth 22 which provides a seamless planar surface over all of the modules. The size of the surface can be arranged so that a projected image is of an adequate proportion and size for use as a projection screen.

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The cloth used on the external surface is of suitable characteristics to adequately reflect impinging light from a digital projector or the like. Such characteristics may depend on the colour, weave or knitted tightness, material (synthetic, etc) and others all of which can be ordered for any particular situation.

10

Fig 11 depicts the module installed in a corner of a room. As the angle of the opposed side walls 12 and 16 (refer Fig 1 as well) are set at  $45^\circ$  to the plane of the front surface of the module this means that these surfaces are at  $90^\circ$  to each other. The same mounting arrangement is possible between a wall and a ceiling. Therefore, the walls 12 and 16 of the module are able to abut adjacent the wall surfaces of a typical room at its corner which are also at  $90^\circ$  to each other.

15

A stacked array of such modules could occupy a floor to ceiling or less height and room for cabling would exist behind the modules. Such cabling could supply power for active audio or video components or audio signal wiring for connection to passive components contained within one or more of the modules.

20

Fig 12 depicts an array of modules located about a video display device 34. In this example the video display device is a plasma display which is mounted in the standard manner on a wall surface. Locating the plurality of modules about the display and arranging the front display surface of the visual display to lie flush with the front major surface of the modules, provides an acceptable aesthetic arrangement. Other arrangements may also be acceptable.

25

If the dimensions of the screen are such that there is a gap between the periphery of the screen and the nearest module, the gap can be filled by an additional frame

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covered with the same material as that used on the modules. As before the modules may enclose one or more of the elements previously described.

In the arrangement depicted in Fig 12, a home cinema arrangement would have a front left and right driver (speakers) in modules to the right and left of the screen, while the centre channel driver (speaker) would be in a module centred in the array and below or above the screen (typically below).

Either diffuser or absorber or combinations of these modules can be used in the remaining modules as required.

Fig 13 depicts an embodiment of a mounting arrangement for one, two or more laterally adjacent modules when the upper rail 36 is used. A rail 40 spaced below the rail 36 can be used for mounting a further row of adjacent modules if the spacing between rails is appropriate.

In a preferred arrangement the rail 36 is of generally U-shape wherein one side of the U is longer than the other. The longer side is horizontally positioned and fixed against a supporting surface 38, generally a wall (see Fig. 14), but it could be a temporary panel or other surface upon which to locate an audio/visual arrangement.

The shorter side of the U-shaped rail is sized and shaped so as to engage a lip, groove, or other means 42 on the rear minor surface of the module 24. The engagement is such that the module remains upright and firmly engaged with the rail, against downward movement. The rail is such that modules can slide along it to achieve a final lateral location for example to align with other non-module elements and other adjacent modules. Once the final location is determined for each module lateral fixing means (not shown) can be employed to fix the lateral position of the module or modules with respect to the rail.

In one embodiment the lateral fixing means may comprise a clamp applied between the rail and an outermost module/s. In another embodiment the lateral fixing means

may be as simple as an engagement groove or tang 44 in the shorter side of the rail that matches a reciprocal tang or groove on the module (not shown). The tang and groove arrangement is a simple arrangement as no tools will be required to achieve the fixing but such an arrangement would not allow unhindered and infinite adjustment of the position of the module along the rail. Many other ways of fixing the module to such a rail will be readily apparent as will be the many ways of mounting a module to a wall.

A further requirement of the rail is that once the module is engaged with the rail, there are preferably no substantial gaps between the rear minor surface of the module and the supporting surface.

With the module preferably lying flush with the supporting surface, the front major surface of the module will be parallel with the supporting surface providing an acceptable aesthetic appearance.

During the process of installing an audio/visual arrangement when more than one line of modules is to be located on a supporting surface, any subsequent rail can be located at an appropriate distance from the previous rail by using a spacer.

Once the subsequent rail is appropriately fixed to the supporting surface, additional modules of the array can be positioned along the second rail, so that the respective lower and upper edges of modules in the array will abut to form a substantially continuous front panel surface to the array as depicted in side view in Fig 14.

Fig 14 also depicts a channel 46 located behind the modules formed at the rear by the supporting surface 32 and side walls 18 and 14 of respective upper and lower modules A and B. The channels thus formed run horizontally and parallel with the rails 36 and 40.

Another channel (not shown in Fig 14) is formed between the modules that run vertically. This channel is formed by the supporting surface 32 and the side walls 16 and 20 of horizontally sideways adjacent modules.

- 5 All the channels provide adequate space for the subsequent running or pre-wired runs of cable from their source to the various elements in the various modules.

- 10 Access for the wiring to each module is made when required by drilling an appropriate aperture into a wall of the module, as preferably the modules are constructed in a solid form without pre-drilled apertures for wiring. Alternatively, binding posts may be made available on one or more of the walls of the module for the quick and secure fixing of prepared cable ends. The binding posts are connected internal of the module to an element mounted therein.

- 15 If the modules are arranged to be adjacent the floor or ceiling, then cables can be readily introduced unseen to any of the channels which are all in communication with each other.

- 20 Alternatively, one exit aperture from internal of the supporting structure (wall) to a location coincident with a channel between modules allows distribution of all of the wiring from that one or even more aperture to all of the modules via one or more of the channels.

- 25 Such an arrangement is beneficial aesthetically as none or very little of the wiring will be visible to a listener or observer of the audio/visual arrangement.

- 30 The arrangement is modular in that the different features of each module can be combined as required or desired on one or more supporting surfaces. The surfaces will typically be walls of an audio/visual entertainment room but the ease of fitment of the modules and their self contained nature allows them to be used on temporary wall structures such as are typically constructed in demonstration spaces. The modules can even be fitted on to the ceiling of rooms having changeable ceiling tiles.

Inherent in their design is the ability to keep the associated wiring hidden from the sight while providing easily accessible spaces for adjustment or rewiring as the modules are all capable of being removed and replaced as required.

5

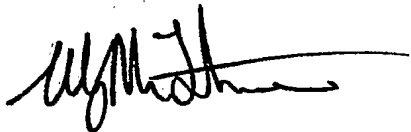
It will be appreciated by those skilled in the art that the invention is not restricted in its use to a particular application described. Neither is the present invention restricted in its preferred embodiment with regard to the particular elements and/or features described or depicted herein. It will be appreciated that various

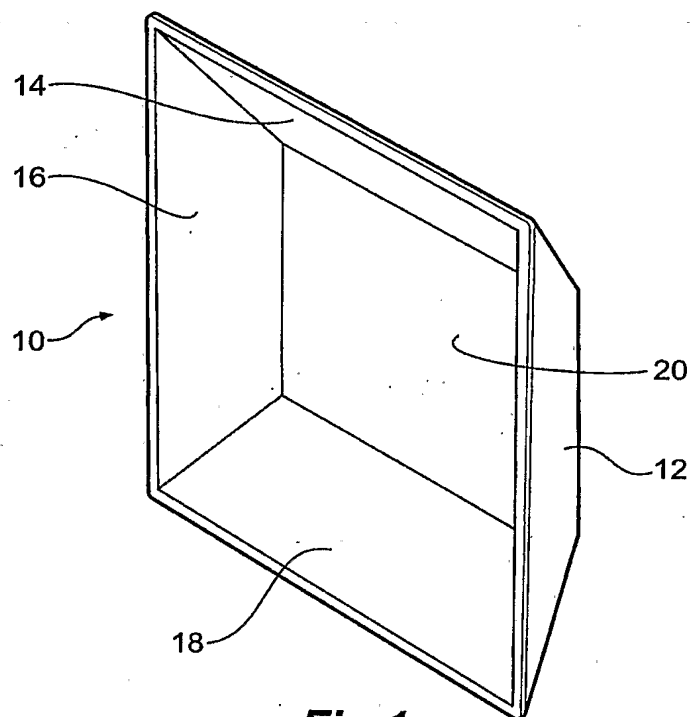
10 modifications can be made without departing from the principles of the invention. Therefore, the invention should be understood to include all such modifications within its scope.

15 DATED this 24<sup>th</sup> day of March, 2004.

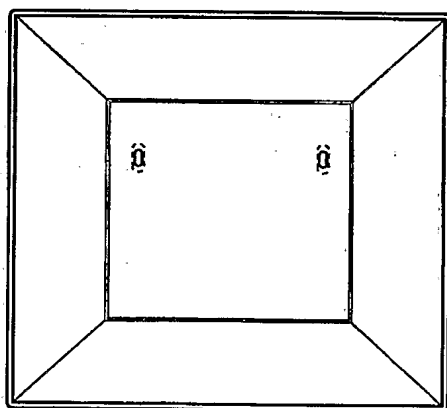
Phillip Vafiadis  
By his Patent Attorneys  
MADDERNS

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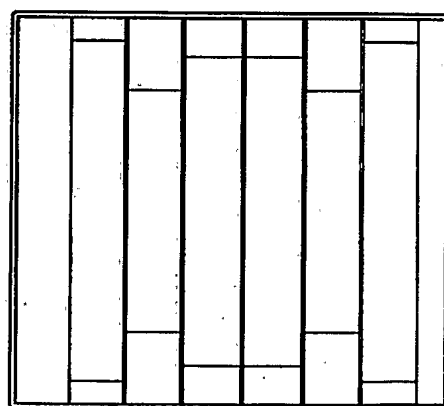




**Fig 1**

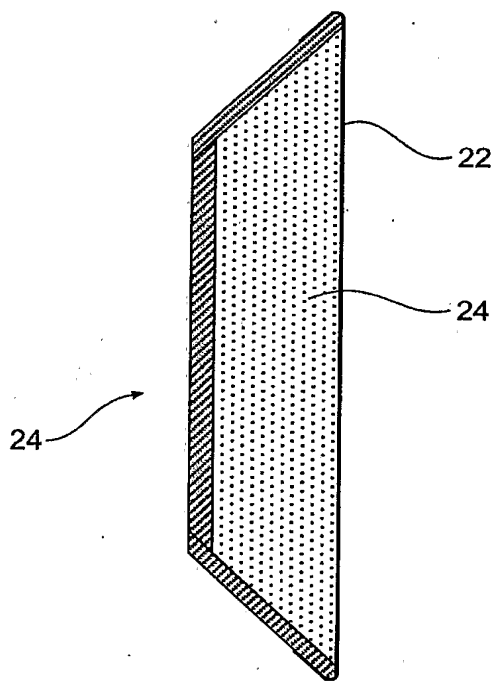


**Fig 2**

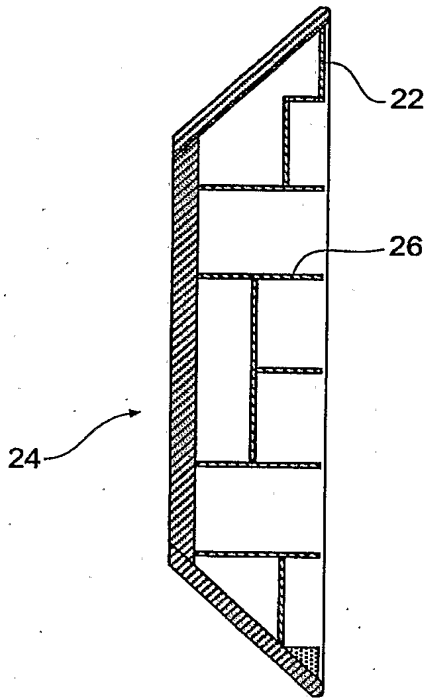


**Fig 3**

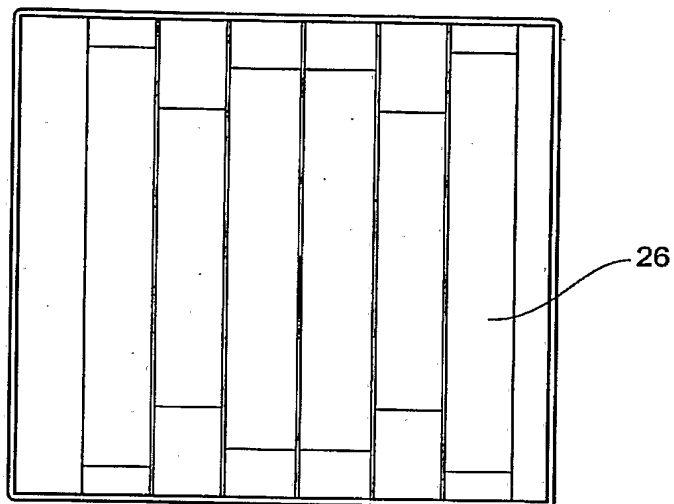




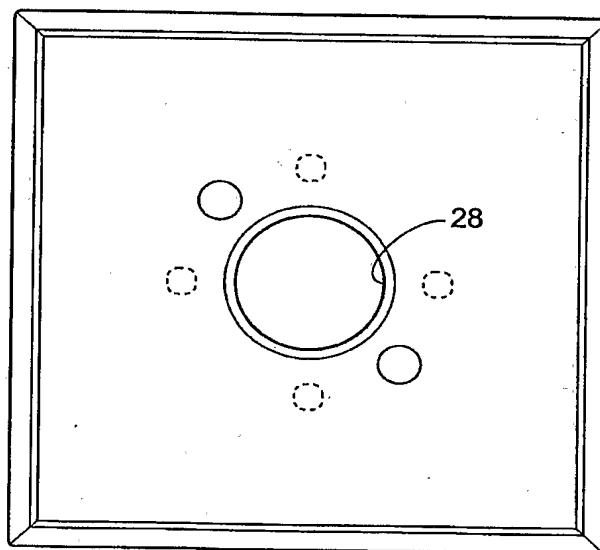
**Fig 4**



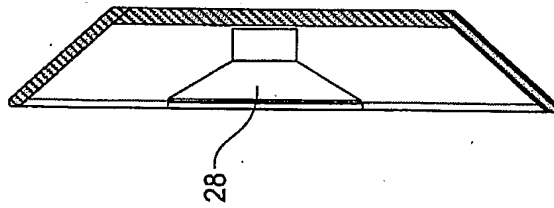
**Fig 5**



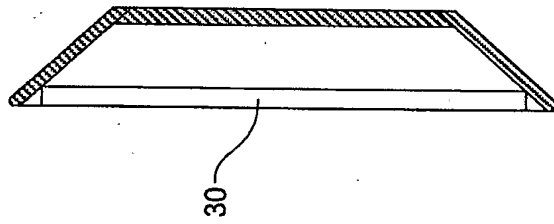
**Fig 6**



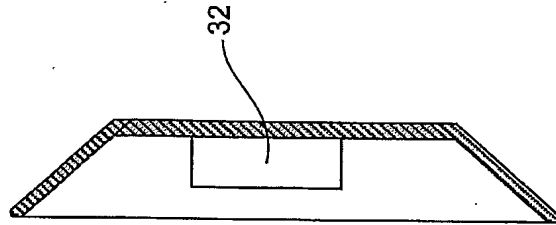
**Fig 7**



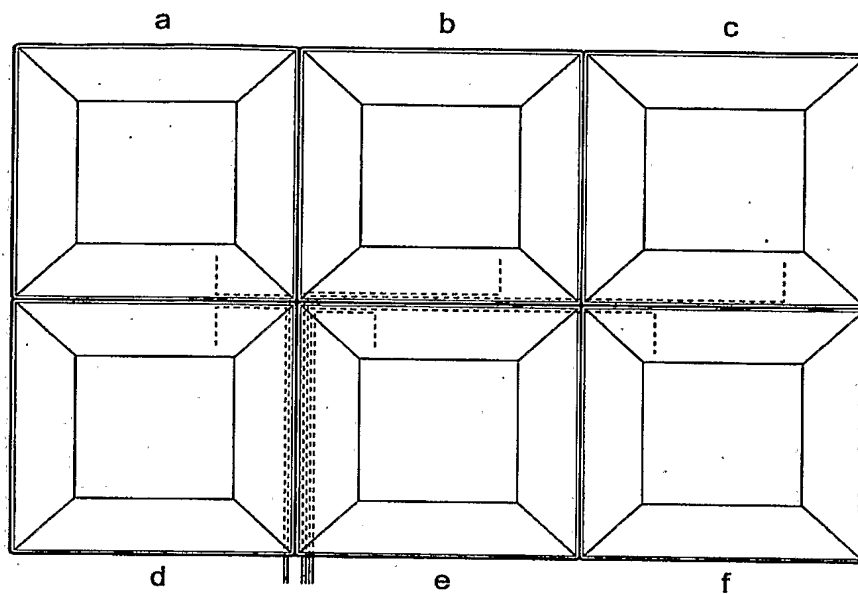
**Fig 8a**



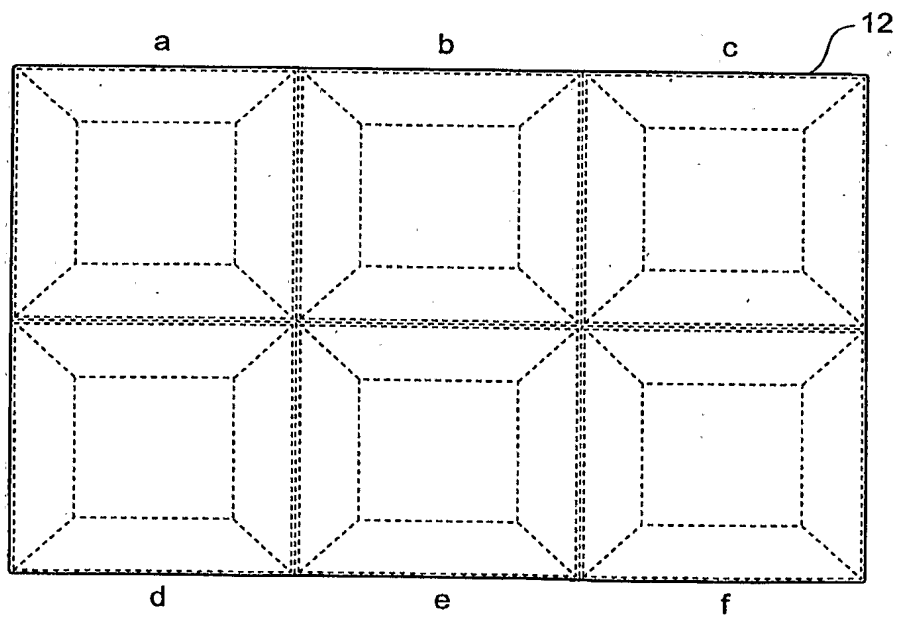
**Fig 8b**



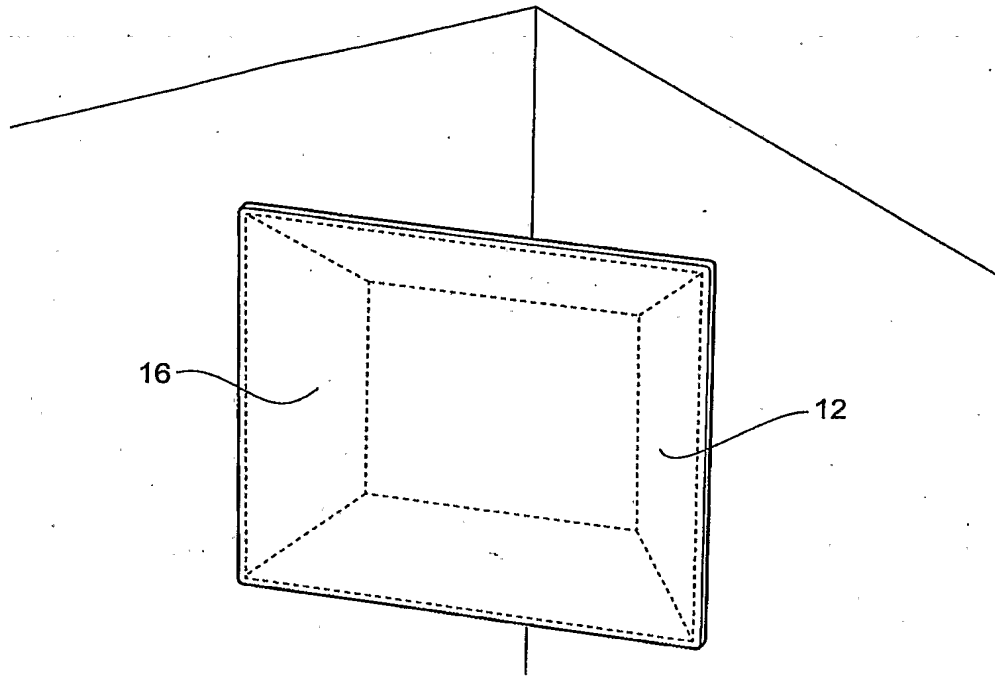
**Fig 8c**



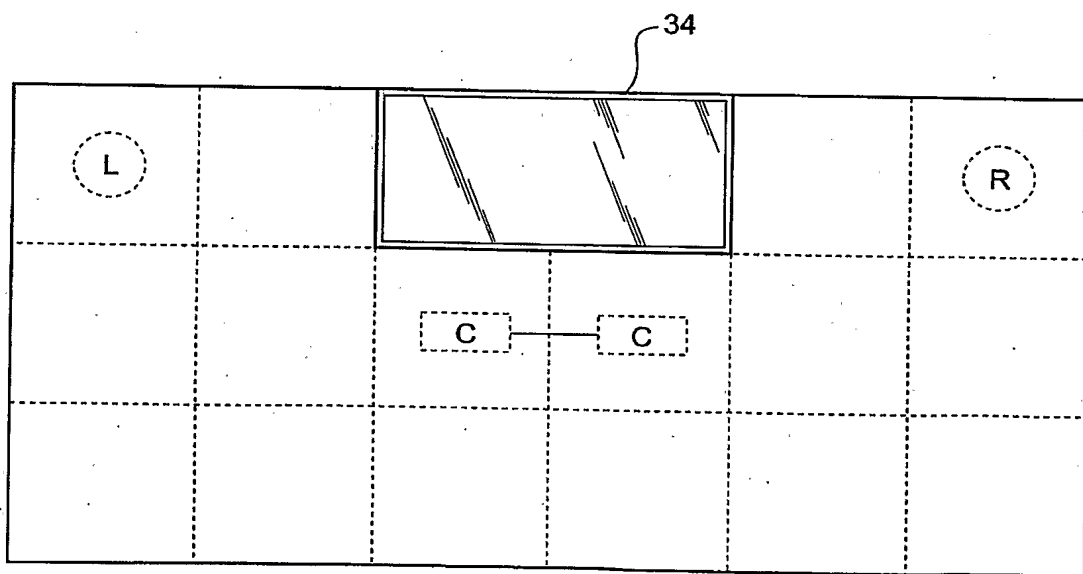
**Fig 9**



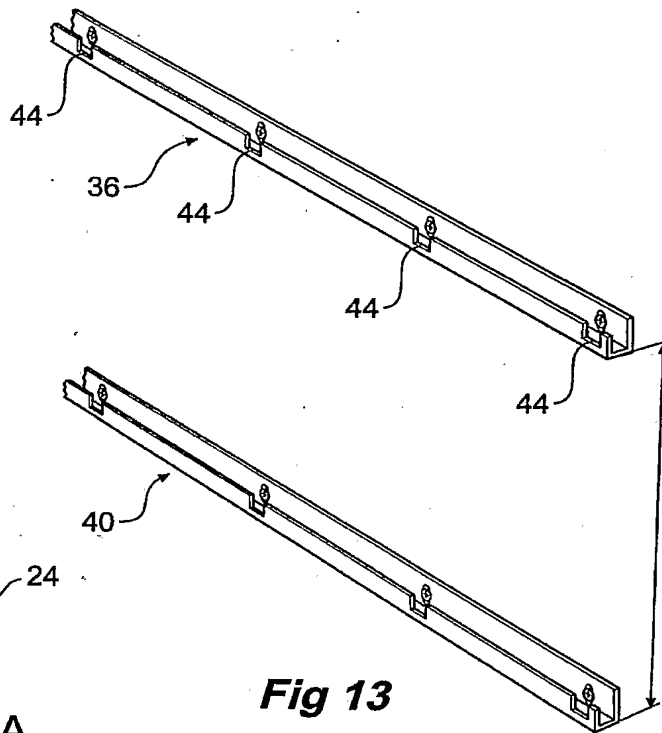
**Fig 10**



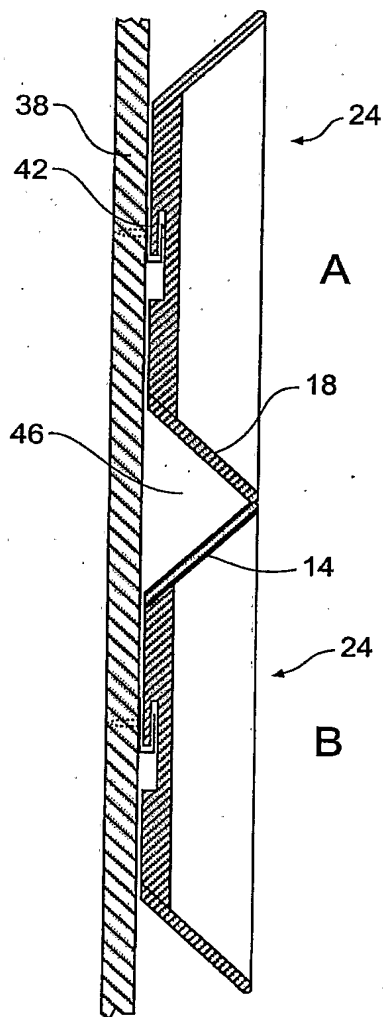
**Fig 11**



**Fig 12**



**Fig 13**



**Fig 14**